

AMENDMENT TO THE CLAIMS

Claims 1-11 (Canceled)

12. (Currently Amended) A high pressure discharge lamp ~~according to claim 6~~, comprising:

a quartz glass bulb;

conductive elements, said conductive elements being airtightly sealed at sealing portions of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed so as to be opposite the other and each of said electrodes being connected to one of said conductive elements,

wherein R_{\max} of a contacting portion of each of said electrodes is about 5 μ m or less,

wherein R_{\max} is a maximum of an absolute value of a difference between a distance from an axial center of each of said electrodes to a particular point on a surface of each of said electrodes and a mean value of the distance, and

wherein ~~the~~ a maximum value of ~~the~~ a surface roughness of a portion other than ~~the~~ an end portion of each of said electrodes is in ~~the~~ a range between about 5 μ m and 12 μ m.

13. (Currently Amended) A high pressure discharge lamp ~~according to claim 6~~, comprising:

a quartz glass bulb;

conductive elements, said conductive elements being airtightly sealed at sealing portions of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed so as to be opposite the other and each of said electrodes being connected to one of said conductive elements,

wherein R_{\max} of a contacting portion of each of said electrodes is about 5 μ m or less,

wherein R_{\max} is a maximum of an absolute value of a difference between a distance from an axial center of each of said electrodes to a particular point on a surface of each of said electrodes and a mean value of the distance, and

wherein ~~the~~ a maximum value of ~~the~~ a surface roughness of a portion of other than ~~the~~ an end portion of each of said electrodes is in ~~the~~ a range between about 7 μ m and 9 μ m.

14-19. (Canceled)

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20. (Currently Amended) ~~The~~ A high pressure discharge lamp ~~according to claim 1,~~
comprising:

a quartz glass bulb;

a conductive element which is airtightly sealed at a sealing portion of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed in said quartz glass bulb so as to be opposite the other and said each electrode of said pair of electrodes being connected to said conductive element,

wherein a part of said each electrode of said pair of electrodes is sealed with said quartz glass bulb at said sealing portion so as to generate a contacting portion formed by the part of each electrode of said pair of electrodes and said quartz glass bulb, and

a maximum length L_{max} of the contacting portion is defined as:

$L_{max} (mm) \leq 200/(P \times D)$; and

a minimum length, L_{min} , of the contacting portion is defined as:

$L_{min} (mm) \geq 0.8 / (D^2 \times \pi)$ or

$L_{min} (mm) \geq 0.7$ whichever is longer,

where D is the diameter (mm) of the corresponding electrode of said pair of electrodes and P is the power (W) supplied to the corresponding electrode of said pair of electrodes, and

wherein said contacting portion covers a distance L from the sealing portion to ~~the~~ an end of the electrode, said end of said electrode terminating inside and beyond ~~the~~ an edge of a foil.

21. (Currently Amended) ~~The~~ A high pressure discharge lamp ~~according to claim 1,~~
comprising:

a quartz glass bulb;

a conductive element which is airtightly sealed at a sealing portion of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed in said quartz glass bulb so as to be opposite the other and said each electrode of said pair of electrodes being connected to said conductive element,

wherein a part of said each electrode of said pair of electrodes is sealed with said quartz glass bulb at said sealing portion so as to generate a contacting portion formed by the part of each electrode of said pair of electrodes and said quartz glass bulb, and

a maximum length L_{max} of the contacting portion is defined as:

$L_{\max}(\text{mm}) \leq 200/(P \times D)$; and

a minimum length, L_{\min} , of the contacting portion is defined as:

$L_{\min}(\text{mm}) \geq 0.8/(D^2 \times \pi)$ or

$L_{\min}(\text{mm}) \geq 0.7$ whichever is longer,

where D is the diameter (mm) of the corresponding electrode of said pair of electrodes and P is the power (W) supplied to the corresponding electrode of said pair of electrodes, and wherein said power is in a range between 120-200 W.

22. (Canceled)

23. (Currently Amended) ~~The~~ A high pressure discharge lamp according to claim 1,
comprising:

a quartz glass bulb;

a conductive element which is airtightly sealed at a sealing portion of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed in said quartz glass bulb so as to be opposite the other and said each electrode of said pair of electrodes being connected to said conductive element,

wherein a part of said each electrode of said pair of electrodes is sealed with said quartz glass bulb at said sealing portion so as to generate a contacting portion formed by the part of each electrode of said pair of electrodes and said quartz glass bulb, and

a maximum length L_{\max} , of the contacting portion is defined as:

$L_{\max}(\text{mm}) \leq 200/(P \times D)$; and

a minimum length, L_{\min} , of the contacting portion is defined as:

$L_{\min}(\text{mm}) \geq 0.8/(D^2 \times \pi)$ or

$L_{\min}(\text{mm}) \geq 0.7$ whichever is longer,

where D is the diameter (mm) of the corresponding electrode of said pair of electrodes and P is the power (W) supplied to the corresponding electrode of said pair of electrodes, and wherein said diameter of said each electrode is between 0.4 - 0.8 mm.

24-25. (Canceled)

26. (Currently Amended) ~~The~~ A high pressure discharge lamp ~~according to claim 6.~~
comprising:

a quartz glass bulb;

conductive elements, said conductive elements being airtightly sealed at sealing
portions of said quartz glass bulb; and

a pair of electrodes, each electrode of said pair of electrodes being disposed so as to be
opposite the other and each of said electrodes being connected to one of said conductive
elements.

wherein R_{\max} of a contacting portion of each of said electrodes is about $5\mu\text{m}$ or less,

wherein R_{\max} is a maximum of an absolute value of a difference between a distance
from an axial center of each of said electrodes to a particular point on a surface of each of
said electrodes and a mean value of the distance, and

wherein said contacting portion covers a distance from the sealing portion to ~~the~~ an
end of the electrode, said end of said electrode terminating inside and beyond ~~the~~ an edge of a
foil.